

brilliant purple ("Sehpurpur") in the sensitive apparatus of the retina of some animals, particularly the lizard. When the *Cyanea* is placed in a glass aquarium this colour fades in less than an hour to a dirty brick-red. When the Medusa is sick, even in the open sea, it is always this colour which is affected first, and turns into a dirty coffee-colour long before the tentacles begin to drop off, which is always a sign of approaching death.

In my paper on the structure of *Cyanea annaskala* I pointed out that no pigment occurs in the marginal bodies, and that therefore the organs of sight of this species, if to be found in the marginal bodies at all, were not nearly so highly developed as in the other Medusæ, or even as in other species of the same genus which *do not possess purple mouth-arms*.

Sensitive cells are very numerous, particularly in the purple margin, and *contain* the purple substance. Ganglion-cells are also met with there. The pigment in the other parts might be considered as reserve material for that which may perhaps be used up by the sensitive cells. I do not go so far as to draw the conclusion which the reader will have inferred from the preceding lines; but I should like to hint at the possibility of the mouth-arms of our Medusa being able to perceive light.

LII.—*Notes on Hawaiian Neuroptera, with Descriptions of new Species.* By the Rev. THOMAS BLACKBURN, M.A.

SOME years ago I sent a small collection of Hawaiian species of this order to Mr. McLachlan, concerning which a remarkably interesting paper from that gentleman's pen appeared in the Ann. & Mag. Nat. Hist. for October and November 1883. It was at the time a matter of much regret to me that the number of specimens I was able to send Mr. McLachlan was very meagre, owing, I think, to the fact that the Neuroptera occupy only a secondary place in my studies, rather than to their being of rare occurrence on the archipelago. Since the appearance of the above-mentioned paper my scanty leisure time has been devoted to describing new Hawaiian Coleoptera; but as that work is now completed (so far as my materials go), I think it might not be without interest if I were to pass in review the results of my exploration, not hitherto published, in the other orders. In doing so I shall not attempt to name and describe species, except where they happen to have very salient characters, but shall content myself with indicating their affinities in general terms, leaving their more precise disposal for the possibilities of the future. I pro-

pose to furnish a paper on the Neuroptera first, and to arrange that paper in the form of some remarks on each of the families recorded as Hawaiian.

## PSEUDO-NEUROPTERA.

### Termitidæ.

I have not met with any more than the two American species recorded in Mr. McLachlan's paper. They are both extremely common near Honolulu, flying in numbers to lamps at night, and doing much damage in the destruction of furniture and other woodwork, also frequently destroying trees. Without having given sufficient attention to the subject to generalize with absolute confidence, I may say that the Termitid connected with *household* depredations, when identified by me, has always been *Calotermes castaneus*, Burm. (which, moreover, I have not observed outside Honolulu), while the *tree* devastator when identified has always been *C. marginipennis*, Latr. This latter species I have observed on several of the islands and occasionally in remote parts of the forests.

### Embiidæ.

The single Embiid I have noticed (*Oligotoma insularis*, McLachl.) seems to be widely distributed. It is a common visitor to lamps at night. I have frequently discovered it feeding in numbers in old wooden roofs of houses, but do not remember meeting with it elsewhere, though doubtless this is merely the result of insufficient observation.

### Psocidæ.

Of these I have three or more species allied to that which Mr. McLachlan considers may be *P. bifasciatus*, Latr., but no other near *Elipsocus vinosus*, McLachlan. These insects were all taken from dead branches of trees in the forests, where they abound.

## ODONATA.

*Pantala flavescens*, F., *Tramea lacerata*, Hag., and *Anax junius*, Drury, are all very common all over the islands.

I have a single specimen taken on Maui which I have no doubt is *A. strenuus*, Hag. The expanse of its wings is just about a quarter greater than that of my largest *A. junius*. Its colour is much darker, noticeable especially in the ner-

vures of the wings, which are quite black. It is a male, and its *genitalia* differ from those of *A. junius* as follows:—Of the superior appendages the apical spine is very much shorter and less acute, and the angles at the two points where the internal edge of the appendage is successively contracted are much more rounded off. The plate which forms the inferior surface of the lower appendage is darker in colour and not wider than long (viewed from beneath), and there are only two *very obtuse* teeth on the upperside. There can be little doubt of the distinctness of this species from *A. junius*. My specimen was captured at an elevation of more than 4000 feet. The species is very strong on the wing, and very shy and difficult to capture. I have seen what appeared to be specimens of it frequently, but always at a considerable elevation, on the higher mountains. It is a really magnificent dragon-fly.

#### Agrionina.

Of these I possess several species, which I shall venture to describe as follows:—

#### *Agrion? satelles*, sp. nov.

Allied to *A. calliphya*, McLachl. The pterostigma is smaller, surmounting scarcely more than one cellule. The quadrilateral is less elongate, its upper edge being not more than half the length of the lower in both pairs of wings. Postpterostigmatic cellules irregular (in one of my specimens they form a single row on the posterior wings, in the other they are partially duplicated, but on one posterior wing more than on the other). Three cellules between the quadrilateral and the nodus.

Prothorax obscurely spotted with red (I have a specimen of *A. calliphya* in which the same part has some red spots).

Hind body red, with only some obscure black markings.

In the male the hind margin of the tenth segment is strongly excised semicircularly. The superior appendages are longer than the segment, stout, blackish, pointed at apex, greatly dilated at base, without a basal tubercle. Inferior appendages very little shorter, red, with black tips, very strongly curved upwards.

Female unknown.

Length of hind body, ♂ 35 millim.; length of posterior wing 22 millim.; expanse 50 millim.

This species occurs on Haleakala, Maui, at an elevation of about 4000 feet above the sea.

*Agrion? oahuense*, sp. nov.

Another ally of *A. calliphya*, McLachl. Pterostigma lozenge-shaped, surmounting two (on one side in my specimen it surmounts more than two) cellules, blackish. Quadrilateral elongate, with its superior edge one third the length of the lower in the anterior wings, nearly a half in the posterior. About twenty postcubital nervules in anterior wings; about fourteen in the posterior. Three cellules between quadrilateral and nodus.

Head and thorax black. Hind body bright red. Labium, labrum, and extreme hind margin of head yellow. Posterior margin (which is rounded) of prothorax and some spots on the disk yellow. Thorax with a narrow dorsal elevation, an antehumeral band, and the lower portion of the sides, yellow. Pectus yellow. Legs yellow, with the spines black. Hind body bright red, apical sixth of third and fourth and nearly the whole of the fifth to eighth segments pitchy. An elongate dorsal impression near the apex of the third to fifth segments; ninth and tenth segments red.

♂. Tenth dorsal segment of hind body very strongly elevated from the base backwards, so that (viewed from the side) it appears much higher at the apex than the base, abruptly truncate behind, the hind margin strongly pubescent. The superior appendages are pear-shaped in outline, but concave; they are contiguous at the base, with the broad ends in contact, and are laid flat along the truncate hind surface of the tenth segment, so that the narrowed ends point out sideways, with their concavities facing backwards; the narrowed ends are somewhat turned upwards and backward. The upper half of these appendages is black, the lower half red. The lower appendages are small, conical, red, with black tips.

Female unknown.

Length of hind body, ♂ 40 millim.; length of posterior wing 22 millim.; expanse 50 millim.

This species is remarkable for the length of its hind body, which is so great that the total length of the insect is scarcely less than the expanse of the wings.

A single specimen occurred on Oahu, but the exact particulars of its capture have been lost.

*Agrion? nigro-hamatum*, sp. nov.

Another of the *A. calliphya* group. Pterostigma reddish brown, surmounting scarcely more than one cellule. Quadrilateral with its superior edge not quite (in the anterior wings), just about (in the posterior), half the length of the lower.

Fourteen postcubital nervules in anterior wing, twelve in posterior. Three cellules between quadrilateral and nodus.

Colour dark bronzy green above, testaceous beneath.

Labium, labrum, and a narrow line along back of head (which is fringed with yellow hairs) not quite reaching the eyes, bright yellow. Posterior margin of prothorax (which is elevated and rounded) and some obscure spots yellow. Thorax with a well-defined elevated central line, a broad antehumeral line, and some broad lateral lines, yellow. Pectus yellow.

Legs bright yellow, with the knees, tips of tarsi and of claws, and the spines intensely black.

Hind body with segments 1-8 narrowly edged with testaceous colour at base; segments 9 and 10 entirely pale brown.

♂. Tenth segment very strongly and triangularly emarginate. Superior appendages yellow, with the apex black. These appendages are strongly compressed and of almost uniform width (viewed from the side) to the apex, where they are sharply hooked, the hook pointing downwards. The lower appendages are conspicuously longer than the upper; they are broad at the base (viewed from the side) and contracted to beyond the middle, from which point they are slightly dilated again and turned upwards, terminating each in two short sharp spines; they are yellow, with the tips black.

Female unknown (subject to the N.B. below).

Length of hind body, ♂ 40 millim.; length of posterior wing 22 millim.; expanse 55 millim.

A single specimen occurred on Maui, but details of the capture are lost.

N.B.—I have three specimens taken in the Nuuanu valley, Oahu, which differ from the above insect as follows:—The markings on the head and thorax are more obscure and of a dirty testaceous colour; the upper edge of the femora is black, and the tenth segment in the male is less strongly excised; the apical segments of the hind body are coppery rather than brown in tint (in one specimen this colour extends to the eighth segment of hind body as well as the ninth and tenth, and in another it is almost confined to the tenth). The genitalia of the female do not differ much from those of female *A. hawaiiense*, McLachl., save that the appendages of the valvules are red and the tenth segment has a more distinct longitudinal dorsal elevation. The male appendages have such strongly marked characters in common that I think the specimen taken on Maui (described above) and these Oahuan specimens must be regarded as local races of a single species in spite of their differences, especially since the Oahuan specimens differ in



colouring *inter se* ; but it is quite possible I may be mistaken in this opinion.

*Agrion? koelense*, sp. nov.

This insect appears to me nearer *A. hawaiiense* than any other known to me. Pterostigma surmounting rather more than one cellule. Quadrilateral with its superior edge about half the length of the lower in both pairs of wings. About fifteen postcubital nervules in anterior wings, about thirteen in posterior. Three cellules (rather more in the anterior wing on one side of my specimen) between the quadrilateral and nodus.

Colour entirely steely black, save the labium, which is dull testaceous. Here and there the colour shades off into steely blue.

♂. Tenth segment gently and triangularly excised. Superior appendages strongly compressed, forcipate; viewed from the side each of them has the appearance of a parallelogram, of which the upper apical extremity is produced into a long and the lower into a short process; in reality, however, these processes are turned inwards before their extremity and terminate in spines. The lower appendages are not much shorter than the upper, and are strongly dilated at the base, but pointed at the apex, the points being directed upwards and inwards.

♀. My specimen is so badly mutilated as to be insufficient for description. The upper appendages of the *genitalia* are wanting; the remaining parts of them, however, are entirely black.

Length of hind body, ♂ 35 millim.; length of posterior wing 22 millim.; expanse 50 millim.

Two specimens occurred on Lanai, flying in a ravine near a place called Koele.

*Agrion? pacificum*, McLachl.

I observe that in Mr. McLachlan's paper the localities where this species was taken are said to be "Lanai and Oahu." This is, unfortunately, a mistake, very likely a slip of the pen on my part. The islands on which I met with the species were Maui and Lanai.

## PLANIPENNIA.

### Hemerobiidæ.

I see Mr. McLachlan (for want of sufficient evidence) justly hesitates to consider the *Megalomus* I sent him endemic. I

feel no doubt, however, that species of this family (and probably a good many of them) are strictly endemic. It will readily be believed that an entomologist not making the Neuroptera a specialty would be unlikely to do justice in his collecting to a group of flies so obscure as this; yet I have three, if not four, distinct species in my scanty collection of Hawaiian Neuroptera. Moreover, I doubt much whether I have seen any of the family very near to any place whither imported plants or shrubs would be taken, and can say quite positively that they are far more numerous at a considerable elevation in the mountain-forests than elsewhere. I have taken Hemerobiidæ on Oahu, Maui, and Hawaii, and have a strong impression of having *seen* them on Kauai, Molokai, and Lanai. I shall not attempt to describe any of them, as I have neither literature nor special knowledge of the family sufficient to justify me in doing so. None of them appear to me very remarkable or very different from European forms.

### Chrysopidæ.

This family is richly represented in the Hawaiian archipelago, and probably there are scores of distinct species. I think I have met with examples on every island, and in all kinds of localities, often in considerable abundance.

There are three species in my collection which I shall venture to describe as possessing strongly marked characters not likely to be capable of confusion with those of other species.

#### *Anomalochrysa Maclachlani*, sp. nov.

Body, legs, palpi, and antennæ pale reddish yellow, the hind body being darker towards the apex; basal joint of antennæ strongly bulbous.

Pronotum decidedly longer than broad, moderately narrowed anteriorly. The posterior angles considerably produced backwards; a deep (though fine) transverse impression a little behind the middle.

Thorax with the surface extremely uneven, consisting of large smooth bulbous tubercles.

Hind body of the male clothed with long fine hairs (very easily rubbed off). The terminal segment forms a large oval plate, concave above, with the lateral margin strongly turned up and abruptly thickened in the middle; the posterior margin only slightly raised. The ventral plate, forming the under surface of this portion of the hind body, is considerably longer than broad, and is of a somewhat triangular shape, its base

being of the width of the upper plate and its apex much narrower, strongly rounded and turned upward to meet the apex of the dorsal plate. Between the two plates (but not protruding from them) a blackish organ can be perceived, but it is too completely folded between the plates for its form to be ascertained.

Wings of the appearance of thin plates of ivory, white, with a strong greenish opaline lustre. Neuration nearly of the same colour, and therefore not conspicuous. The neuration is furnished, as in *A. hepatica*, McLachl., with rather long hairs, which, however, are of an obscure colour and excessively fine. The neuration does not appear to me to differ noticeably from that of *A. hepatica*, but, owing to its colour, it is difficult to make out. There are evidently five series of gradate nervules, of which the first consists of nearly twenty and the fifth of about ten nervules (the intermediate ones being much confused), and there are upwards of thirty anteposterostigmatic costal nervules. The wings are somewhat more pointed than those of *A. hepatica*, and the posterior pair are evidently broader in proportion.

♀. Unknown.

Length of body 13 millim., expanse 30 millim.

I took two specimens of this remarkable insect on Mauna Loa, Hawaii, flying by day at an elevation of about 6000 feet, in May 1882.

*Anomalochrysa montana*, sp. nov.

Body, legs, palpi, and antennæ testaceous; pronotum and thorax with a brilliant longitudinal scarlet line; head more or less suffused with red. Basal joint of antennæ strongly bulbous.

Pronotum longer than broad, narrowed anteriorly, with a transverse impression near base.

Hind body of male clothed with hairs; the last segment is in the form of a plate, which is placed upright at a right angle, or nearly so, to the hind body (it is *possible* that this plate may have been contorted at the death of the insect into the position described, though it is so in all my six male specimens). The plate is of an oval shape and is concave on both sides, owing to its much thickened margin. The ventral plate corresponding is triangular and a little turned upwards at the apex.

The wings are vitreous, with an opaline lustre and well-defined neuration; the nervules are all of a greenish colour and are set with long black hairs; the pterostigmatic region is obscurely greenish. There are three series of gradate ner-



vules in both pairs of wings, consisting of about 9, 7 and 8, 7 nervules respectively (the number, however, varies and does not appear to be sexual). There are about twenty-three anteposterostigmatic nervules.

Length of body 8–10 millim.; expanse of male 22–25 millim., female 26 millim.

I captured a short series of this insect flying by day in a forest on Mauna Loa, Hawaii, at an elevation not much under 7000 feet, in May 1882.

*Anomalochrysa ornatipennis*, sp. nov.

Body, legs, palpi, and antennæ liver-coloured, the hind body being darker. Basal joint of antennæ bulbous. Pronotum transverse, with two strong transverse dorsal impressions.

♂. Characters unknown.

Wings vitreous, shining, iridescent; neuration dark brown and very conspicuous, studded throughout with long black hairs. Pterostigmatic region very conspicuous, liver-coloured, marked with three (in the anterior wings) or two (in the posterior) well-defined nearly black spots. Three series of gradate nervules in the anterior wings (in the right wing there are traces of an additional series between the first and second), consisting of 8, 4, and 4 nervules respectively; about seventeen anteposterostigmatic costal nervules.

Length of body 6 millim.; expanse, female, 22 millim.

A single specimen of this insect occurred to me on Mauna Loa, Hawaii, at an elevation of about 4000 feet. Although it is a female, the remarkable and conspicuous marking of the wings justifies its being described and named. It bears a considerable general resemblance to *A. hepatica*, McLachl.

Besides the above, I possess the following Chrysopidæ:—

(a) A single female specimen of an ally of *A. Maclachlani*, captured on the mountains near Honolulu. It is conceivable that it may be the female of the same species; but as it differs somewhat in colour, being of a uniform yellowish *white* (wings included), and has the thorax less elongate, the basal joints of antennæ much more bulbous, &c., I have little doubt that it represents a distinct, though rather closely allied, insect.

(b) A species allied to *A. montana*, but much smaller, and without the scarlet markings. A single male occurred on Haleakala, Maui, and as its sexual characters do not seem to differ much from those of *A. montana*, I hesitate to consider it a distinct species.

(c) A rather distinct-looking species allied to *A. hepatica*, McLachl., and resembling it in colour, though with the neuration of the wings quite obscure. It has three series of gradate nervules on the anterior wings. I do not venture to name it, having only a female specimen, which I captured on Haleakala, Maui.

#### Myrmeleontidæ.

It seems a singular thing that I have met with the one species of this family known as Hawaiian only in a single ravine on Maui, though there it is common enough, and so conspicuous as to seem incapable of escaping notice. It is fairly strong on the wing.

In conclusion I will just say that the non-existence or (more probably) rarity of the Trichoptera is in accord with the state of affairs in other orders. All water-frequenting insects are scarce, the described Dytiscidæ being represented by three (one of which is unique), the Hydrophilidæ by one, and the true water-bugs by two species respectively. There scarcely can be said to be any constant fresh water on the islands. I am not aware of any permanent natural freshwater lake; at any rate, the only one I know that is probably permanent is at an elevation of near 15,000 feet above the sea. (When I visited it, it was frozen over.) There are springs here and there, one of which was a favourite hunting-ground with me, as its moisture attracted insects to the neighbourhood; but I feel sure that no Trichoptera occur there. There are also *streams* which do not absolutely disappear in dry seasons; but the natural state of the islands, apart from modern arrangements for the artificial preservation of water, is that of possessing very little permanent water really fresh. On one of the islands (Lanai) it is said that the horses and other animals do not know how to drink. The comparative abundance of Agrionidæ is remarkable, and I know not how to account for it.

Port Lincoln, South Australia, Oct. 1884.

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LIII.—*Contribution to our Knowledge of Hydromedusa, a Genus of South-American Freshwater Turtles.* By Dr. A. GÜNTHER, F.R.S.

[Plate XIV.]

HAVING recently received a very well-preserved and interesting specimen of *Hydromedusa* from fresh waters south of  
*Ann. & Mag. N. Hist. Ser. 5. Vol. xiv.* 32